

REMARKS

Claims 1-8, 16, 17, 20, 23, and 26-28 are pending in this application.

Applicant has amended claims 16 and 26, and has added new claim 28. These changes do not introduce any new matter.

Allowable Subject Matter

Applicant appreciates the Examiner's indication that claims 5-8 define allowable subject matter. Applicant's responses to the rejections entered in the Office Action are set forth below.

Rejection Under 35 U.S.C. § 101

In response to the rejection of claims 16 and 17 under 35 U.S.C. § 101 as being drawn to non-statutory subject matter, Applicant has amended independent claim 16 to specify that at least one operation of the image output control method is executed by a microprocessor. As such, the method defined in present claim 16 is tied to a particular machine and therefore constitutes a statutory process under 35 U.S.C. § 101. Accordingly, Applicant requests that the rejection of claims 16 and 17 be withdrawn.

Rejections Under 35 U.S.C. § 103

Applicant respectfully requests reconsideration of the rejection of claims 1-3, 16, 20, 23, 26, and 27 under 35 U.S.C. § 103(a) as being unpatentable over *Shimizu et al.* ("Shimizu") (US 2003/0112293 A1) in view of *Otsuki* (US 6,652,067 B2). As will be explained in more detail below, the combination of *Shimizu* in view of *Otsuki* would not have rendered the subject matter defined in independent claims 1, 16, 20, and 23, as presented herein, obvious to one having ordinary skill in the art.

In response to the Applicant's previously submitted arguments, the Examiner notes that the *Shimizu* reference does not disclose a pixel group which is set to have a predetermined number of multiple pixels having a two-dimensional size comprising multiple pixels arranged

in primary and secondary scan directions, nor does *Shimizu* disclose an image output device including:

- 1) a number data receiving module that receives the dot number data of the pixel group with respect to each type of dot;
- 2) a priority order specification module that specifies a priority order of individual pixels in the pixel group for dot creation;
- 3) a pixel position determination module that determines positions of dot-on pixels in the pixel group with respect to each type of dot, based on the dot number data of the pixel group with respect to each type of dot and the specified priority order; and
- 4) a dot formation module that creates the multiple different types of dots at the determined positions of the dot-on pixels.

The Examiner asserts, however, that the above features are shown by *Otsuki*. The Examiner concludes that it would have been obvious to one having ordinary skill in the art to have modified the *Shimizu* reference to include an image output device having the features shown by *Otsuki* so as to be able to print different types of dots at different densities and to increase printing speed (see the Office Action at page 7). Applicant respectfully traverses the Examiner's position regarding the alleged obviousness of the claimed subject matter.

The Examiner interprets *Otsuki* as disclosing a pixel group as defined in claim 1, as well as the related operations performed by the modules recited therein. In particular, the Examiner appears to interpret *Otsuki's* disclosure of drive signals for driving ejection drive elements to form one of N types of dots in a pixel area in response to print signals as being equivalent to the claimed pixel group having a predetermined number of multiple pixels. The Examiner further notes that *Otsuki* teaches that a print signal is converted to dot data for each 4 consecutive pixels in the main scan direction to generate combinations of mask pattern selection data.

However, the portions of the *Otsuki* reference relied upon by the Examiner do not relate to the claimed feature of a pixel group, much less the claimed operations pertaining to the pixel group. Applicant is unclear as to which feature of *Otsuki*'s disclosure the Examiner regards as being equivalent to the claimed pixel group. It appears that the Examiner interprets *Otsuki*'s N types of dots for a pixel area as teaching the claimed pixel group, wherein the pixel area corresponds to the claimed pixel group, and the N types of dots correspond to the claimed multiple pixels which comprise the pixel group. Yet this cannot be the case, for *Otsuki*'s teaching of N types of dots for a pixel area merely relates to the selection of only one of the N types of dots for a single pixel's area. Thus, the cited pixel area is merely a single pixel, and only one of the different types of dots is selected for that pixel area. A single pixel is not a pixel group as claimed, nor can a single type of dot be the equivalent of multiple pixels.

Thereafter, it appears that the Examiner interprets *Otsuki*'s teaching of conversion of dot data for 4 consecutive pixels as somehow related to the claimed pixel group. Yet this portion of *Otsuki* merely relates to a resolution conversion procedure, wherein a high resolution print signal is converted to lower resolution. This is accomplished by taking 4 consecutive pixels from the source high-resolution print signal and determining a type of dot for a single pixel in an output low-resolution print signal. In other words, the single pixel in the low-resolution data effectively replaces the 4 consecutive pixels with a type of dot specified to best approximate the 4 consecutive pixels. While Applicant understands that 4 consecutive pixels might be viewed as a pixel group, it should be noted that claim 1 is in fact drawn to the determination of a number of dots to be created *in the pixel group*. Thus, one having ordinary skill in the art would not have been motivated to apply the claimed determination of the number of dots to be created to *Otsuki*'s 4 consecutive pixels, for the 4 consecutive pixels are actually replaced with a single pixel, and only one type of dot is chosen

for that single pixel. Hence, *Otsuki's* disclosure of 4 consecutive pixels cannot be considered the equivalent of Applicant's claimed pixel group.

Further, it appears that the Examiner interprets *Otsuki's* mask pattern as relating to the claimed pixel group, for the Examiner states that the mask pattern has a two-dimensional size comprising multiple pixels arranged in primary and secondary scan directions. However, *Otsuki* merely teaches a mask pattern used to generate a signal mask for a piezo drive signal for forming different size dots inside a single pixel. This mask pattern does not comprise multiple pixels, for it is used to determine the singular type of dot that will be printed at a single pixel.

The *Otsuki* reference is intended to form multiple dots at the position of a single pixel by generating mask signals. The mask pattern is changed for each of the pixels. Referring to Figure 10 of *Otsuki*, it might appear that dot formation is controlled with respect to four pixels, however, Figure 10 indicates variations of *a single pixel*, and only explains a dot formation mechanism for forming different sizes of dots, namely, large, medium, and small dots by dividing the signal for forming the dots on the pixel into four and masking them. As such, Figure 10 of *Otsuki* does not show a pixel group including multiple pixels.

In view of the foregoing, the *Otsuki* reference does not disclose an image output device having the above-listed features 1) to 4). For example, in support of the obviousness rejection, the Examiner asserts that the hardware/software that performs the function disclosed in column 5, lines 50-60, of *Otsuki* corresponds to the claimed priority order specification module. The portion of the *Otsuki* reference on which the Examiner relies describes the mask pattern of a piezo drive signal for forming large, medium, and small dots *inside a single pixel*. This is intended to increase the types of dots that can be formed in a single pixel, and is significantly different from the position and priority order of dots in a 2 x 4 pixel (see, for example, claim 1 of *Otsuki* which recites, in part, "forming any of N types of

dots which are different in at least one of an ink amount and a dot-formed position in a pixel area”). Thus, in contrast with the claimed subject matter, the focus of the *Otsuki* reference is the dots constituting *one pixel*.

In view of the foregoing, even if one having ordinary skill in the art were to combine the *Shimizu* and *Otsuki* references in the manner proposed by the Examiner, the result of this combination would not have included each and every feature of the subject matter defined in claim 1. As such, the combination of *Shimizu* in view of *Otsuki* would not have rendered the subject matter defined in claim 1 obvious to one having ordinary skill in the art.

Each of independent claims 16, 20, and 23 defines subject matter analogous to that of claim 1, and thus the arguments set forth above regarding claim 1 also apply to claims 16, 20, and 23.

Accordingly, independent claims 1, 16, 20, and 23, as presented herein, are patentable under 35 U.S.C. § 103(a) over the combination of *Shimizu* in view of *Otsuki*. Claims 2, 3, 26, and 27, each of which ultimately depends from claim 1, are likewise patentable under 35 U.S.C. § 103(a) over the combination of *Shimizu* in view of *Otsuki* for at least the same reasons set forth above regarding claim 1.

Applicant respectfully requests reconsideration of the rejection of claim 4 under 35 U.S.C. § 103(a) as being unpatentable over *Shimizu* and *Otsuki*, and further in view of *Shimada et al.* (“*Shimada*”) (US 6,293,643 B1). Claim 4 depends from claim 1. The *Shimada* reference does not cure the above-discussed deficiencies of the combination of the *Shimizu* and *Otsuki* references relative to the subject matter defined in present claim 1. Accordingly, claim 4 is patentable under 35 U.S.C. § 103(a) over the combination of *Shimizu* in view of *Otsuki* and *Shimada* for at least the reason that this claim depends from claim 1.

New Claim

As noted above, Applicant has added claim 28. This claim defines further features of the image output control system defined in claim 1. As such, claim 28 is patentable over the prior art of record for at least the same reasons set forth above with regard to claim 1. In addition, Applicant has amended claim 26 so that this claim depends from claim 28 (instead of claim 1).

Conclusion

In view of the foregoing, Applicant respectfully requests reconsideration and reexamination of claims 1-8, 16, 17, 20, 23, 26, and 27, as amended herein, as well as examination of claim 28, and submits that these claims are in condition for allowance. Accordingly, a notice of allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at **(408) 749-6902**. If any additional fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-0805 (Order No. MIPFP083).

Respectfully submitted,
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